Space Weather Forecast

Issued on Thursday 20 February 2025 at 12:17 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares. Possible glancing CME day 4 (23 Feb)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only occasional common class flares observed, the largest an upper Common-class flare from an ex-region in the southwest quadrant. There are seven sunspot regions on the visible disc, however most of these are relatively small and simple, with little growth or development observed. The most notable regions are two moderately large bipolar regions in the southeast, both have exhibited some mixed magnetic complexity, with an increase in flare activity in recent hours.

A CME (Coronal Mass Ejection) followed the aforementioned Common-class flare in the southwest with modelling results indicating a chance of a glancing blow on day 4 (23 Feb). Additionally a filament was observed to lift off from the southeast, beginning around 20/0500UTC, with a narrow, south directed CME now visible in imagery. Modelling results are pending, however it looks directed well below Earth orbit. Most recently, flaring in the vicinity of the eastern-most larger bipolar region mentioned above and now approaching centre disc, may have produced a new CME. However, updated imagery is awaited to more fully assess.

Solar Wind / Geomagnetic Activity: Easing fast solar winds were observed, but with the additional possible enhancement from one or more weak CME glances. Solar winds were slightly elevated and mainly in the range 450-500km/s. Interplanetary Magnetic Field was Weak, with the north-south component mainly southward pointing. Geomagnetic activity was Unsettled to Active (Kp 3-4) between 19/1800-20/0600 UTC, otherwise Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be generally Low, with a chance of isolated Moderate class flares.

Solar Wind / Geomagnetic Activity:

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A CME followed a Common-class flare at 19/2345 UTC from a now decayed region in the southwest, with modelling results indicating a chance of a glancing blow around the middle of the day (UTC) on day 4 (23 Feb).

Solar winds are still currently slightly elevated, after the recent enhancement from CH15/-, which is no longer visible on the Earth-facing disc. No further enhancements are expected in the next few days with a gradual easing trend expected for the solar wind, perhaps falling to background by the end of the period. However, on day 4 (23 Feb) there is a chance of a glancing CME as mentioned above. Geomagnetic activity is forecast to be mainly Quiet with isolated Unsettled intervals, and a slight chance of Active intervals, mainly early in the period. On day 4 (23 Feb) there is a chance for an increase to G1/Minor Storm levels due to a possible glancing CME.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background levels.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	1	1	30
Strong	G3	No	1	1	1	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	No	40	40	50	50
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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